Solar Energy: monitoring and energy estimation

ABSTRACT

In recent years we have been witnessing unprecedented growth of renewable energy generation. However renewables are highly dependent on local weather conditions, making their resources intermittent. The solar energy is especially affected by dayly cycle and clouds. It is important to estimate in advance these effects on power plants because they induce changes in energy generation and cause operational issues like plant partial shading, over-irradiation, and energy dispatch.

Syllabus:

The subject will be treated in four talks of one hour, within 15 minutes of questions and answers. The subject of each talk is:

Module Description of solar energy physics: astronomical and atmospheric variabilities.

Module 2-) Clouds properties and their role on the energy generation. Over-irradiation impacts.

Module 3-) Solar energy monitoring and sensors. Estimation of measurement uncertainty

Module 4-) Forecasting methods overview.

PROFILE OF THE STUDENTs: PhD Students and undergraduate and graduated Engineers: Mechanical, Electronic, Electric, Energy and Civil.

MOTIVATION:

The seminar aims at engaging the students with the prediction of the solar energy source . The main tasks of the course are:

- Introduction of the basics of solar astronomical and atmospheric phenomena.
- Description of some atmospheric variability sources like clouds.
- Description of the sensors used to monitor and estimate the amount solar energy.
- Description of modern forecasting methods

VENUE: "Lorenzo Poggi" Lybrary – School of Engineering – Building A – Fist floor – DESTEC.

Dates:

26th March 2024 – 14:30 – 17:00 - Modules 1 and 2

27th March 2024 - 14:30-17:00 – Modules 3 and 4.